



ACCESS
Arctic Climate Change
Economy and Society



Project no. 265863

ACCESS
Arctic Climate Change, Economy and Society

Instrument: Collaborative Project

Thematic Priority: Ocean.2010-1 "Quantification of climate change impacts on economic sectors in the Arctic"

**D2.81– Identification of governance challenges facing Marine
Transport on all Arctic Routes**

Due date of deliverable: **30/06/2014**

Actual submission date: **13/03/2015**

Start date of project: **March 1st, 2011**

Duration: **48 months**

Organisation name of lead contractor for this deliverable: **UCAM**

Project co-funded by the European Commission within the Seventh Framework Programme (2007-2013)		
Dissemination Level		
PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	X

Executive Summary

The governance of Arctic shipping involves a complex array of legal regimes, most importantly the legal framework United Nations Convention on the Law of the Sea (UNCLOS) ; International Maritime Organization conventions; Arctic state agreements; and, a host of actors and stakeholders. Government officials, marine insurers, ship classification societies, international organizations, ship owners, cargo owners and more, all can influence Arctic shipping law, practice and policy issues. Since shipping is a global enterprise servicing international trade, global and circumpolar approaches must be taken in the Arctic. The efforts in the Arctic for shipping governance involve harmonization of the rules and regulations at the international level and among the Arctic state systems. Uniformity is sought so that all shipping enterprises can compete on a level playing field in international commerce.

Key Conclusions and Strategic Issues for ACCESS include:

- UNCLOS as the legal framework for the maritime Arctic.
- UNCLOS Article 234 which allows the coastal states the right to adopt and enforce pollution prevention, reduction and control laws in ice-covered waters.
- IMO Polar Code as a seminal and historic advance for polar marine safety and environmental protection.
- The importance of the new Arctic Search and Rescue (SAR) and Arctic oil spill preparedness and response agreements among the Arctic states.
- Port and flag state control issues in the future maritime Arctic.
- A requirement for the identification of place of refuge in the Arctic.
- Marine boundary agreements among the Arctic states.
- The critical importance of liability and compensation in the future maritime Arctic.
- The critical role of the marine insurance industry in Arctic ‘governance.’
- Evolving new measures regional Arctic governance and protection.
- New roles for the Arctic Council and Arctic Economic Council.

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1. Introduction

The governance of Arctic marine shipping and marine operations has a number of important layers, both international and regional in scope. The UN Convention on the Law of the Sea (UNCLOS) of 1982 sets out the legal framework for the Arctic Ocean just as it does for all the world's oceans. International measures primarily from the International Maritime Organization (IMO), the responsible UN maritime body, address marine safety, maritime pollution, crew training and experience, and maritime security issues. These measures in conventions ratified by the maritime states are focused on creating uniform rules and regulations so that there is a level playing field, essentially harmonized rules, for the global maritime enterprise. On 1 January 2017 a new, mandatory Polar Code for ships operating in polar waters will come into force. This Code is a set of binding rules and measures applied to ships operating in Arctic and Antarctic waters. A host of stakeholders including marine insurers, operators, owners, maritime administrations, and ship classification societies will address adherence to an enhanced and uniform set of marine safety and environmental protection standards for polar ships. The IMO Polar Code is an historic new governance regime for Arctic and Antarctic waters.

Two national and regional governance regimes for Arctic shipping have evolved. Both regimes have as their basis, in part, UNCLOS Article 234 which allows the coastal state the authority to enact special rules and regulations for marine safety and environmental protection of ice-covered waters. Canada has developed its *Arctic Waters Pollution Prevention Act* (AWPPA) which has stricter pollution standards than IMO regulations for the global oceans. The Russian Federation has also adopted special regulations for its Northern Sea Route (NSR) applied from the Kara Gate in the west to Bering Strait in the east along the waterways of the Russian maritime Arctic. *The Regulations for Navigation on the Seaways of the NSR* (1991) provide strict guidance on mandatory icebreaker escort, pollution standards, a fee system, mandatory pilotage, and other measures to address marine safety and the prevention of pollution in Arctic waters.

A host of stakeholders and actors influence governance of Arctic marine operations by addressing legal, policy and standard practice issues. The marine insurance industry, not

regulated by any international conventions, is critical to future Arctic navigation but within this industry there is little experience in evaluating the risks of operating in Arctic waters. The ship classification societies will be important to the implementation of the IMO Polar Code as they will deal with issues related to the flag state issuance of Polar Ship Certificates and the development of Polar Water Operational Manuals for current and future polar ships. The salvage industry will be expected to play an increasing role in the maritime Arctic and will be guided by the *International Convention on Salvage* (1989) which established the legal principles for salvors and salvage operations. Liability and compensation in the event of a spill, for example, is a form of governance. However, the international system for compensation for ship-source spills is limited and fragmented and application to the Arctic remains unclear. In addition, one of the real challenges for governance of Arctic shipping is that many of the largest flag states and the key states that supply the global maritime labor force do not border on the Arctic Ocean.

2. The Importance of UNCLOS

The legal framework for the Arctic Ocean and all oceans is the 1982 UN Convention on the Law of the Sea (UNCLOS). Jurisdiction and control of Arctic shipping and marine operations in coastal areas are handled by a mix of authorities under the Arctic coastal states, the flag states and the port states. Article 234 of UNCLOS provides the coastal states with authority to regulate international shipping and enforce special non-discriminatory measures regarding pollution prevention and reduction in ice-covered waters. Article 234's extends to the limits of the coastal state's Exclusive Economic Zone (EEZ) that is ice-covered most of the year, but there remain key questions about its implementation and interpretation.

2.1 Coastal State Jurisdiction

In the Arctic five of the eight Arctic states are fronting the Arctic Ocean: Canada, Denmark (Greenland), Norway, Russia, and the United States. The coastal states have a set of maritime zones that are outlined in UNCLOS: internal waters, the territorial sea, the contiguous zone, the Exclusive Economic Zone (EEZ), and the continental shelf. For internal waters the coastal state is entitled to exclusive sovereignty, control and jurisdiction over any ships. For the territorial sea a coastal state can declare 12 nautical miles where it has full sovereignty over

shipping except that foreign ships have the right to innocent passage. Coastal states can also claim a contiguous sea 12 nautical miles beyond the territorial sea where they can enforce violations of customs, fiscal, immigration and sanitary laws and regulations (that they enforce in their territorial sea as well). In the EEZ a coastal state has limited enforcement powers over Arctic shipping that might cross their waters. Article 76 of UNLOS allows the coastal state to extend its boundary beyond the 200 nautical mile EEZ and claim the rights to any natural resources that would be in the seabed. However, the waters above any extended continental shelf are considered high seas and are not under any jurisdiction of the coastal state (meaning no authority or control over marine operations and the transit of ships).

2.2 Flag State Control

Flag states that certify ships are an integral part of the governance of global shipping. A flag state must ensure that its ships conform to international rules and standards particularly safety at sea and environmental pollution issues. On the high seas, such as in the central Arctic Ocean, the flag state is granted exclusive jurisdiction. Of importance to the Arctic is that most of the ships today and in the future will not likely be from Arctic flag states but more likely ships flagged in nations from around the globe. How these ships adhere to the IMO Polar Code will be one of the challenges to the control and enforcement of rules and regulations by the coastal Arctic states.

2.3 Port State Control

International law and practice provides that a port state can impose rules and regulations for the entry of foreign ships into its ports. The coastal state has broad authority when a foreign ship is in one of its ports for inspection and enforcement, particularly for pollution violations. A port state may prevent a ship from sailing if it determines it to be unseaworthy or might threaten the marine environment. One of the challenges for the Arctic states will be enforcement of the special rules and regulations using the authority of the port state. Cooperation between the flag states (from around the globe) and port states in the Arctic will enhance environmental protection and marine safety through enforcement of future standards.

2.4 International High Seas in the Arctic Ocean

The area in the central Arctic Ocean that lies beyond the Exclusive Economic Zones of the five Arctic Ocean coastal states is an international high seas area where no coastal state jurisdiction applies. Governance of these marine waters is international and not regional or coastal. Ships sailing on future trans-Arctic voyages would only be subject to global (IMO) safety, environmental and security rules and regulations. One of key aspects of the new IMO Polar Code is that the Code would apply to this remote region at the top of the world. There is also a movement by several of the Arctic states and the Arctic Council to assess the need for additional protection measures for the high seas area of the Arctic Ocean. A challenge to Arctic shipping may come when more comprehensive restrictions on navigation may be imposed beyond the scope of the IMO Polar Code.

2.5 UNCLOS Article 234

Article 234 of UNCLOS allows the coastal state the right to adopt and enforce non-discriminatory pollution prevention, reduction and control laws in areas (within the Exclusive Economic Zone) that are ice-covered most of the year. Canada and Russia have adopted such laws and regulations in their respective Arctic coastal seas. Article 234 is a special authority to allow coastal states to bolster their powers to regulate Arctic shipping. There remain a number of issues about the application of this Article such as the definition of the ice cover for most of the year. There are also some questions regarding the application of Article 234 to straits used for international navigation. This form of governance relates to a specific geographic area of coverage (in ice-covered waters) and the scope of Arctic coastal state regulatory powers. In the future other coastal Arctic states such as Norway (for Svalbard) and Denmark (for Greenland) may develop special national rules and regulations over Arctic marine operations using Article 234 as a basis for such authority.

3. IMO Rules and Regulations

IMO is the responsible UN body for maritime affairs and engagement with the global shipping enterprise. Maritime safety, environmental protection and security issues are at the forefront of the work of national maritime administrations at IMO. Most of the work at IMO has not been specifically related to the Arctic and Arctic marine operations, except for the most recent work on the mandatory Polar Code. Many of the requirements of the conventions will obviously influence ships that may voyage in Arctic waters.

3.1 Marine Safety Rules

The *International Convention on Safety at Life at Sea (SOLAS)* of 1974 covers most of the international safety standards for commercial shipping. These are included in rules and regulations on ship construction, machinery, equipment, and operation of ships. Notably the flag states are responsible for ensuring their ships meet SOLAS requirements. This is a key form of governance that is not constrained if the authority was left with a coastal state or region. The flag state responsibility to enforce IMO rules is reflective of the global nature of Arctic shipping. SOLAS includes specific rules and regulations for passenger vessels. The Polar Code will have additional standards to be met regarding marine safety equipment for operation in Arctic waters such as the east and west coasts of Greenland.

3.2 Marine Environmental Protection Rules

The major rules and regulations for marine environmental protection are in the *International Convention for the Prevention of Pollution from Ships (1973) as Modified by the Protocol of 1978 Relating Thereto (MARPOL 73/78)*. Established in MARPOL are the international standards for pollutant discharges from ships. Six annexes set out the rules and procedures for the following pollution control: I by oil; II by noxious liquid substances; III by harmful substances in packaged for; IV by sewage; V by garbage; and, VI by air emissions. Each of these annexes will eventually be addressed for the Arctic but only four will be addressed by the new Polar Code (Annexes I, II, IV, and V). It is important to note that MARPOL does not totally prohibit the discharge of wastes into the marine environment as limits are established for some pollutants such as oily ballast and bilge waters.

3.3 Mandatory IMO Polar Code

The IMO Polar Code whose implementation phase will begin in May 2015 will establish mandatory or binding international standards for new and existing commercial carriers and passenger ships operating in Antarctic and Arctic waters. The Polar Code is an historic new governance regime that addresses marine safety and environmental challenges for ships operating in remote, sometimes extreme, environmental conditions where marine infrastructure is limited or non-existent. The Polar Code is directly related to protecting Arctic people (in coastal Arctic communities) and the Arctic marine environment. The IMO with the Polar Code is creating a uniform, non-discriminatory set of rules and regulations that will provide a level playing field for all marine operators. The Polar Code is not a new IMO convention, but is a set of amendments to two existing IMO safety and environmental protection instruments – the *International Convention for the Safety of Life at Sea* (SOLAS) and the *International Convention for the Prevention of Pollution from Ships* (MARPOL) – to adapt and enhance ship systems for operations in polar waters. A third critical element being addressed is the experience and training of ship’s officers and crew, especially the ice navigators in the pilothouse on voyages in ice-covered waters. All ships under the Code will be required to obtain a Polar Ship certificate from the flag state. Each ship will also be required to have onboard a Polar Water Operational Manual specific to a given polar ship.

The boundary for the Polar Code in the Southern Ocean around Antarctica is 60 degrees south. The Boundary in the Arctic for application of the Polar Code includes adjustments in the North Atlantic for the warmer waters flowing northeast from the Gulf Stream. In the Bering Sea, the Polar Code boundary for application will be 60 degrees north. This boundary took into account the presence of a world class fishery in the Bering Sea and the importance of environmental protection in the region. The Boundary moves slightly south to accommodate all of Greenland and then runs northeast along the east Greenland coast and north of Iceland until it intersects with the Russian Arctic coast in the Barents Sea. All of Iceland, Norway, and the Kola Peninsula in northwest Russia are not included within the Polar Code area since they are generally ice-free year-round.

The Polar Ship Certificate will classify a ship for operation in polar waters as one of three ship types:

- Category A ~ Designed for operation in at least medium first-year ice which may include old ice inclusions (Polar Class 1 to 5 equivalent).
- Category B ~ Designed for operation in at least thin first-year ice which may include old ice inclusions (Polar Class 6 or 7 equivalent).
- Category C ~ Designed to operate in open water or ice conditions less severe than those in categories A and B).

The category types in the Polar Code provide flexibility in the rules since not all ships are intended for operation in the same ice conditions and the same polar season. For example, a non-ice strengthened passenger vessel, which normally operates in open water, on a summer voyage along the west coast of Greenland would be classified as a Category C ship. The Polar Ship Certificates will be approved by the flag states and would include information on polar ship category and ice class, operational limitations, and, required additional safety, communications, and navigation equipment. The Polar Water Operational Manual will include ship specific information such as operational capabilities and limitations and other practical requirements to support the owners and operators of ships operating in polar waters.

The Polar Code also includes reference to a harmonized classification of Polar Class ships as developed and adopted by the International Association of Classification Societies (IACS). Table 1 indicates the system of seven Polar Classes according to intended ship operations and the level of ice conditions in the area of operation. These Unified Requirements and Polar Classes apply to ship of IACS member associations constructed on or after 1 March 2008.

Since 2010 the IMO Marine Safety Committee has been considering safety amendments to SOLAS. The

IMO's Sub-committee on Ship Design and Construction has discussed a broad range of themes including polar ship design and construction, and required marine safety and lifesaving equipment. The proposed amendments to MARPOL have been considered by the IMO's Marine Environmental Protection Committee which has reached consensus on the mandatory application of the Polar Code for select MARPOL Annexes: Annex I (Prevention of pollution by oil); ANNEX II (Prevention of pollution by noxious liquids); ANNEX IV (Prevention of pollution by sewage; and, ANNEX V (Prevention of pollution by garbage). The IMO's Sub-Committee on Human Element Training and

Watchkeeping in early 2015 reviewed the critical training and manning requirements for polar operators.

All of the elements of the Polar Code should be adopted by the IMO committees by April 2015 and by the whole in May 2015. The Polar Code will have both mandatory and recommendations for safety and pollution prevention measures. The implementation phase for the Polar Code will commence in May 2015, and it is anticipated that the Code will come into force on 1 January 2017. During this implementation phase (2015-17) the United States, as Chair of the Arctic Council, will lead the states in advocacy for the IMO Polar Code within the global maritime community and communicate its importance to a global audience. The new Polar Code will be a framework agreement and a beginning of a long process to further protect polar waters during an era of increasing marine operations. The Code deals with commercial carriers and passenger vessels, but not fishing vessels and other specialized ships. It does not address black carbon from ship emissions, heavy fuel use in the Arctic (heavy fuel use is banned in the Antarctic) and, ballast water discharge. While additional amendments to SOLAS and MARPOL will likely come in the future, the new Polar Code is a new governance regime in 2017 for polar waters, in force nearly a quarter century after the first meetings held in 1993 by an Outside Working group to IMO.

4. New Arctic State Treaties

Two recent treaties, or binding agreements, among the Arctic states have added new governance to the Arctic Ocean for marine operations and shipping. The 2011 agreement rescue (SAR), *Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic*, establishes broad SAR cooperation and responsibility among the Arctic states. Areas of responsibility for each of the eight have been established where the Arctic state will take the coordination lead in the event of a SAR situation. Regions of responsibility reach to the North Pole and extend into the North Atlantic and North Pacific. However, these new SAR boundaries do not prejudice any other boundaries between the states or their sovereignty. The agreement establishes protocols for notifying each of the Arctic states and mandates that each Arctic state have a rescue coordination center for Arctic SAR. The Arctic states have agreed to exercise their SAR assets together in training situations. Importantly, the Arctic states address in the agreement the critical issue of requests to enter the territory of a Party for SAR operations. The Arctic SAR Agreement entered force on 19 January 2013 following ratification by each of the eight (Arctic) signatory states. While the SAR

Agreement does not address directly the overall infrastructure required to conduct Arctic SAR operations, it does place an onus on the Arctic states to have rescue coordination centers and some assets available for emergency operations. With this new SAR instrument, the Arctic states have addressed the recommendation in the Arctic Council's *Arctic Marine Shipping Assessment 2009 Report* (AMSA) which stated the need for a comprehensive, multi-national SAR agreement in recognition of the remoteness and limited resources in the region.

A second binding agreement and form of Arctic Ocean governance was signed by the Arctic Ministers in Kiruna, Sweden on 15 May 2015. Negotiated under the auspices of the Arctic Council, the *Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic* also responds to a recommendation in AMSA regarding circumpolar environmental response capacity and coordination. The Agreement focuses on Arctic oil spills and the need for each Arctic state to have a national 24-hour system for response and notification of the Parties in all situations involving Arctic oil spills. The agreement also addresses several key requirements: the monitoring of spills by the Parties; facilitation of cross-border transfer of resources for response to spills; the conduct of future exercises and joint training among the Parties; and, a requirement for joint reviews of response to Arctic oil spills. A set of operational guidelines in responding to Arctic oil spills is an appendix to the agreement. The language of this Arctic state agreement presumes that each of the eight Arctic states has a national command structure to deal with Arctic oil spill response and available infrastructure and assets to respond to such an emergency. The Arctic Oil Spill Agreement is in its implementation phase with joint exercises to be held among the Arctic states; a key objective of these exercises will be to test the level of cooperation needed to adhere to elements of the treaty and make sure adequate communication is available and facilitated in emergency response. Timely cooperation, coordination and response to an Arctic oil spill emergency by the Arctic states are critical forms of governance of Arctic marine operations in the 21st century. Both the Arctic SAR and Arctic Oil Spill agreements are advances in Arctic state cooperation in the practical aspects of emergency response and foster coordination in responding to future maritime emergencies in remote Arctic waters.

5. National Legal Frameworks: Canadian and Russian Regimes

5.1 Canadian Arctic Waters Regime

The voyage of the *SS Manhattan* in 1969 moved Canada to respond with national legislation to protect its Arctic waters from future commercial traffic. The *Arctic Waters Pollution Prevention Act* (AWPPA) of 1970 is still in force today. The AWPPA established a 100-nautical mile pollution prevention zone in Arctic waters and prohibited all deposit of waste by any person or ship. The zone has since been extended to the entire Exclusive Economic Zone around the Canadian Arctic using UNCLOS Article 23 as partial justification of this decision. The Act also authorized the sub-division of the Canadian Arctic waters into shipping safety zones and to develop regulations for the control of shipping within the zones including construction, equipment and crewing standards. Pollution control officers were given broad authority to board and inspect ships within a safety control zone. The Act also mandated that no tanker would be allowed to operate in any control zone without the services of a qualified ice navigator.

The pollution standards are also much stricter in the Canadian Arctic than MARPOL. There is also a mandatory system of vessel reporting (NORDREG) and a system of routing requirements where ships of a certain ice strength or capability can operate within the shipping safety control zones. Much of the Canadian Arctic is considered by Canada as internal waters so the governance of these waterways is of strict sovereign control with broad law enforcement powers that can be exercised by the maritime authorities.

5.2 Russian Federation Northern Sea Route Regime

The Russian Federation has an Arctic shipping regime in place that is quite different than the Canadian approach. Regulations for the Northern Sea Route (NSR) adopted in 1990 and 1996 allow navigation along the NSR on a non-discriminatory basis for all states. Russia has also used UNLOS Article 234 to apply special rules and regulations for pollution prevention and safety in its ice-covered waters. Pollution standards, as with Canada, are stricter than MARPOL. Applications to use the NSR must be made to the NSR authorities. Mandatory

pilotage is required and ships using the NSR must carry two pilots (ice pilots). There is a fee system in place to support icebreaker escort, pilotage and NSR infrastructure. Mandatory icebreaker escort has in the past been required (by the NSR legislation) in all straits of the Russian Arctic waters. The NSR is defined as the waters north of the Russian Arctic starting in Kara Gate in the west and ending in Bering Strait to the east. It is important to note that the Barents Sea is not a formal part of the NSR. It is likely that continuing changes in the rules and regulations will be the norm for the NSR. The fee system is under continuous review and is evolving as potentially more ships might use the NSR. One challenging aspect will be how the Russian authorities integrate the new IMO Polar Code with their national regulations.

6. Key Conclusions and Strategic Issues for ACCESS

6.1. UNCLOS:

The 1982 UN Law of the Sea Convention (UNCLOS) sets the legal framework for general governance of the global oceans, including the Arctic Ocean. UNCLOS provides a legal regime for shipping and marine operations using a set of maritime zones including the 12-nautical mile territorial sea and a 200-nautical mile Exclusive Economic Zone (EEZ). In the territorial seas the Arctic states have full sovereignty but foreign ships retain the right to innocent passage. A key international high seas area remains in the central Arctic Ocean after the five Arctic Ocean coastal states (Canada, Denmark-Greenland, Norway, Russia and the United States) extend their EEZs. No coastal state, or group of coastal states, have jurisdiction and control over this high seas area; only international agreements such as those from the International Maritime Organization (IMO) apply. UNCLOS strives to balance coastal state jurisdiction & control, and, flag state jurisdiction & control with the historic concept of freedom of navigation throughout the global oceans.

6.2 UNCLOS Article 234:

Article 234 of UNCLOS has special significance to Arctic shipping and to the ACCESS project. This ‘ice-covered seas’ article allows the coastal state the right to adopt and enforce

non-discriminatory pollution prevention, reduction and control laws and regulations in areas (within the EEZ) that are ice-covered most of the year. Canada and Russia have adapted such rules and regulations in their respective Arctic coastal seas (with the extent of their EEZs). The Canadian Arctic Pollution Prevention Regulations and the Russian rules for use of the Northern Sea Route have as their legal basis application of the Arctic 23 of UNCLOS. The challenge for Arctic shipping and marine operations regarding Arctic 234 is that such laws and regulations are not uniform and they vary widely among the coastal states.

6.3 IMO Polar Code:

The IMO Polar Code will be a seminal agreement for the maritime states and an historic advance for polar marine safety and environmental protection. For the Arctic it will be a critical regime for protecting Arctic peoples. The Polar Code will apply to commercial and passenger ships operating in the Arctic Ocean and adjacent seas (and Antarctic waters south of 60 degrees S). The Polar Code will not be a new IMO convention, but rather existing conventions such as SOLAS and MARPOL will have amendments that will apply to ships in Arctic waters. The amendments are specific regulations added to the already existing rules and regulations for global marine operations. The draft elements of the Polar Code will be adopted in April 2015 and in May 2015 enter into an implementation phase for full adoption by 2017. The Polar Code will include a range of new governance and binding measures: polar ship structural standards; marine safety equipment requirements; experience and training standards and requirements for navigators and other ship's crew; requirements for a Polar Ship Certificate and Polar Water Operations Manual; and, measures for the prevention of pollution by oil, noxious liquids, sewage, and garbage.

6.4 New Arctic Treaties:

Two new Arctic treaties or agreements provide governance to specific issues related to maritime operations. The 2011 binding *Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic* not only strengthens SAR cooperation and coordination, but establishes areas of SAR responsibility for each of the eight Arctic states.

The special SAR regions of responsibility reach to the North Pole and in several regions into the North Pacific and Atlantic oceans. The 2013 *Agreement on Maritime Oil Pollution Preparedness and Response in the Arctic* focuses on oil spills and issues of response, cross-border resource transfer, joint exercises, monitoring and party notification. The development of both these treaties, although ultimately negotiated by the eight Arctic states, was facilitated by the Arctic Council. Both treaties are currently in their implementation phases and the Arctic Council and maritime community will be able to follow the progress of the Arctic states in developing their close cooperation in the practical aspects of Arctic emergency response, a critical component of Arctic maritime governance. Effective governance resulting from the implementation of these treaties is influenced heavily by the levels of investment in infrastructure that governments and industry will make in the Arctic.

6.5 Port and Flag State Controls:

Under international law the port states in the Arctic have the authority to impose conditions for the entry of foreign ships into its ports. Port states can perform inspections and have enforcement powers over foreign ships in their ports. Under Article 219 of UNCLOS, the port state can prevent a ship from sailing if it is determined that the ship is unseaworthy and threatens damage to the marine environment. The maritime states, also called the flag states, have key roles to play in the governance of Arctic maritime operations. UNCLOS provides that the states can control the ships flying their flag; ships are allowed to sail under the flag of one state only as noted in Arctic 92. All flag states are required to ensure that ships under their flag conform to international rules and standards such as the new Polar Code when it is codified in 2017.

6.6 Identification of Places of Refuge:

One of the challenges to be faced in the future of the Arctic is to identify (by the coastal state authorities) places of refuge for ships that are in distress. The IMO issued in 2003 *Guidelines on Places of Refuge for Ships in Need of Assistance* and this document provides a risk assessment framework for coastal state authorities and ship masters and salvors who may be on site. Sheltered waters normally designated as places of refuge will be more difficult

identify in the Arctic due to the dynamic nature of sea ice and the surrounding polar marine environment. Also, the lack of infrastructure such as salvage, SAR response and environmental response make the decisions to where places of refuge might be appropriate. A complete suite of places of refuge will be difficult to develop in advance, as the changes in sea ice by season may dictate the choice of safe and suitable locations. The new Arctic Coast Guard Forum might study the importance and challenges of designating places of refuge throughout the maritime Arctic.

6.7 Bilateral Maritime Boundary Agreements:

The lack of clearly defined or delimited maritime boundaries is a key issue for Arctic shipping companies and also offshore drillers. In disputed areas shippers will not know which national rules and regulations apply; if a spill occurs how would response and compensation be orchestrated? Many Arctic boundaries have been resolved (a key one in the Barents Sea between Russia and Norway in 2010), but unresolved boundary issues remain for example in northern Baffin Bay between Canada and Denmark, and in the Beaufort Sea between the United States and Canada. Offshore developments can be hindered or delayed if the maritime boundary is not fixed. Future resolution of these regional boundaries by the Arctic states will add clarity to the local governance when transits occur across these boundaries.

6.8 Liability and Compensation:

The current international system related to liability and compensation for maritime incidents (and damages and economic loss) is fragmented and in some cases limited. An IMO international regime does exist for compensation caused by ship-source pollution. Compensation is available to governments and other maritime authorities for clean-up operations, and to private parties who have suffered damage from marine pollution. Ship owners under these regimes are normally liable for the loss or damage only up to a certain amount. One of the key issues for the Arctic Ocean is that these conventions for liability and compensation do not apply to the international high seas beyond the coastal state jurisdiction. Thus the entire central Arctic Ocean, as a high seas area, would not be covered by an existing

liability and compensation regime during an era of potential growth of Arctic shipping in higher latitudes. This is a critical gap identified in ACCESS that may require future Arctic state cooperation and agreement.

6.9 Important Role of Marine Insurance:

The marine insurance industry is critical to the global maritime industry and to the emergence of Arctic shipping and increasing marine operations in Arctic waters. While the marine insurance industry is a form of ‘governance’ there are no international conventions covering the global oceans or more specifically, the Arctic Ocean. One of the challenges is that the risks associated with Arctic marine operations are often not fully known or fully understood. The information and data on Arctic shipping is minimal to base insurance rates for ship’s hull and machinery, and importantly for cargoes (in the cold and harsh Arctic environment). Therefore robust insurance market patterns do not exist for the Arctic making it difficult to assume the risks of Arctic navigation. The issue will continue to be vexing for the Arctic states and global shipping community until larger numbers of reliable and safe voyages are conducted in all seasons and ice covers.

6.10 New Measures of Regional Arctic Governance:

One of the evolving challenges for the Arctic states is to identify areas in the Arctic marine environment where special IMO provisions may be implemented. The Polar Code will amend MARPOL to include mandatory no discharges in the Polar Code defined regions for oil, noxious liquids, sewage and garbage. A future task will likely be to designate an Air Emissions Control Area for stricter air pollutant emissions in the Arctic Ocean (none exists today). One region that surely will require future attention will be the Bering Strait Region, an international waterway (strait) and the only link between the Arctic Ocean and North Pacific. This region will eventually require some form of routing that will have to be submitted to the IMO by Russia and the United States. Restriction on the use of heavy fuel in Arctic waters will be a continuing issue. Increased monitoring and Arctic marine domain awareness (use of data from IMO mandatory AIS transponders) will also provide an enhanced governance of the Arctic Ocean. The Arctic states in the future will also address the

uniformity of shipping regimes in the Arctic and potential measures for protection of the central Arctic Ocean, beyond coastal state jurisdiction (an example could be IMO designation as a Particularly Sensitive Sea Area).

6.11 Future Roles of the Arctic Council and Arctic Economic Council:

The Arctic Council will continue to focus its efforts on environmental protection and sustainable development issues. Passenger ship and tanker safety will continue to gain attention as the highest risk vessels sailing in the ice or remote areas. New rescue technique and dealing with capacity issues of response issues will gain research funding. New, proposed governance measures will result from the efforts of the Arctic Council working groups on Protection of the Arctic Marine Environment (PAME) and Emergency Prevention, Preparedness and Response (EPPR). The newly established Arctic Economic Council could in the future propose routing and response measures and standards that Arctic shipping companies might adopt. Neither the Arctic Council nor the Arctic Economic Council will be an operational body with decision-making powers so the work of the Councils will always be advisory to international bodies such the IM O, International Hydrographic Organization (IHO) and World Meteorological Organization (WMO).

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Table 1: Polar Class Ship Categories (International Association of Classification Societies)

Polar Class	General Description
PC 1	Year-round operation in all ice-covered waters
PC2	Year-round operation in moderate multi-year ice conditions
PC3	Year-round operation in second-year ice which may include multi-year ice inclusions
PC4	Year-round operation in thick first-year ice which may include old ice inclusions
PC5	Year-round operation in medium first-year ice which may include old ice inclusions
PC6	Summer/autumn operation in medium first-year ice which may include old ice inclusions
PC7	Summer/autumn operation in thin first-year ice which may include old ice inclusions.

[Note: Ice descriptions follow the World Meteorological Organization sea-ice nomenclature.]